

Application No. 09/396,266
Docket No. 1998U007A.US
Reply to Office Action Dated May 15, 2003

Remarks

New Claims

New claims 33-42 are before the Examiner. Claims 1-3, 5, 7-11, 14-20, 22, 24-28, 31 and 32 have been cancelled. The new claims find support in the specification at page 3, lines 29 and 30, and the examples in the specification.

Page 10, third paragraph

Section 103 Rejections

Previous claims 1-3, 5, 7-11, 14-20, 22, 24-28 and 31-32 (now claims 33-42) have been rejected under 35 U.S.C. 103(a) as being unpatentable over *Machida et al.* ('577) and *Nakanaga et al.* ('622). This rejection is respectfully traversed.

Machida et al. in essence disclose literally thousands of metallocenes, including mono cycloalkadienyl, monocycloalkadienyl -hetero atom, and bis(cycloalkadienyl) metallocenes employing both alumoxanes and the ionic activators. It should be readily recognized by the Examiner that the Patentees make no distinction amongst the literally thousand of choices of metallocenes. It should also be noted that *Machida et al.* are primarily looking to obtain macromers. The macromers are then employed as a comonomer with olefins to form branched polyolefins. No example in *Machida et al.* employs the catalyst systems in accordance with the instant claims. In fact, *Machida et al.* include monocyclopentadienyls which are specifically excluded from the instant application. For example, example 1 employs pentamethylcyclopentadienylyltitanium trimethoxide, example 2 employs a metallocene and triisobutyl aluminum, example 4 employs a bis(cycloalkadienyl)metallocene, and example 5 employs pentamethylcyclopentadienylyltitanium tributoxide. The remaining examples also employ catalyst systems outside the scope of the instant claims.

view as whole

Not only are the catalyst systems of *Machida et al.* outside the scope of Applicant's but when one compares the activities obtained by *Machida et al.* the unexpected results of the instant invention becomes completely clear. The activities of *Machida et al.* were calculated in units that are employed in Applicant's claims. For

Application No. 09/396,266

Docket No. 1998U007A.US

Reply to Office Action Dated May 15, 2003

Example 1 of *Machida et al.* that employs pentamethylcyclopentadienyltitanium trimethoxide the activity was 1.2 g/(mmol h). The examples in the instant application obtain activities that are 50,000 to 1 million or more over that of *Machida et al.* *Machida et al.* example 2 obtains a macromer and the activity is 740 g/(mmol h). Example 5 demonstrates an activity of 495 g/(mmol h). It is therefore urged that the ordinary practitioner in the art would recognize that the activities are so low that one would avoid the use of mono Cps altogether because they are not at all economically useful. Applicant on the other hand has unexpectedly discovered that certain mono Cps can be usefully employed for the polymerization of olefins to polymers, not macromers (as shown in *Machida et al.*). It is therefore respectfully submitted that the instant claims are unobvious in the sense of 35 U.S.C. 103 over *Machida et al.* Withdrawal of the rejection over *Machida et al.* is respectfully asked.

Nakanaga et al. do not disclose any activator that is a neutral or ionic ionizing salt comprising a cation selected from the group consisting of triphenylcarbenium, dimethylanilinium, and trialkylammonium, and an anion selected from the group consisting of borate and aluminate (non coordinating anions). At page 4, lines 19 and 20 *Nakanaga et al.* state that the "activity per unit transition metal was still inadequate." Such a statement combined with the activities demonstrated by *Machida et al.* is deemed to be proof of the unobviousness of Applicant's claimed invention. In view of the absence of any activators as recited in the instant claims and a teaching away from that which is instantly claimed it is respectfully submitted that *Nakanaga et al.* fail as a reference under 35 U.S.C. 103. Withdrawal of the rejection over *Nakanaga et al.* is respectfully asked.

Previous claims 1-3, 5, 7-11, 14-20, 22, 24-28 and 31-32 (now claims 33-42) have been rejected under 35 U.S.C. 103(a) as being unpatentable over *Campbell et al.* in view of *Nomura et al.* and *Pellechia et al.* This rejection is respectfully traversed. As in *Machida et al.*, *Campbell et al.* present thousands of possibilities for the metallocene. Furthermore the Patentees teach that the catalyst system is useful for the polymerization of vinyl aromatic monomers. There is no teaching or suggestion to the ordinary

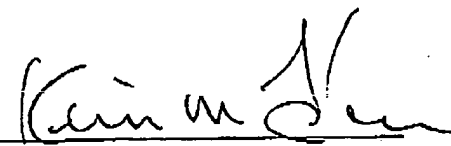
Application No. 09/396,266
Docket No. 1998U007A.US
Reply to Office Action Dated May 15, 2003

practitioner in the art that the instantly claimed catalyst system comprising the certain mono Cps in combination with a non-coordinating anion could be usefully employed for the polymerization of olefins. It is further submitted that *Pellechia et al.* does not help *Campbell et al.* for a selection of catalysts that would be useful for the polymerization of olefins. *Pellechia et al.* unequivocally teaches that activated catalysts based on mono Cps are unstable and hence provides a strong implication that their use is rather limited. Applicant, nevertheless discovered that the certain mono Cps as recited in the instant claims do in fact provided a novel and unobvious catalyst system that can be employed for the polymerization of olefins and unexpectedly accompanied by a high polymerization activity. *Nomura et al.* also do not help *Campbell et al.* with respect to the instant claims since they do not disclose any non-coordinating anions. Withdrawal of the rejection is respectfully asked.

In view of the above new claims and remarks it is respectfully submitted that all the claims in this case are allowable. Prompt notice of allowance is respectfully solicited. The Applicant invites the Examiner to telephone the undersigned attorney if there are any other issues outstanding which have not been presented to the Examiner's satisfaction.

Respectfully submitted,

November 4, 2003
Date


Kevin M. Faulkner
Attorney for Applicant
Registration No. 45,427

Univation Technologies, LLC
5555 San Felipe, Suite 1950
Houston, Texas 77056-2723
Phone: 713-892-3729
Fax: 713-892-3687